

## POSTOPERATIVE X-RAY TREATMENT OF MALIGNANT DISEASE.\*

BY RUSSELL H. BOGGS, M.D.,

OF PITTSBURG, PA.

THE purpose of this paper is to show the necessity of referring malignant cases early for post X-ray treatment, and not waiting until recurrence has taken place, as has been the case in many instances in the past. We should never ask one horse to pull a twenty horse power load. Another oversight, which is common among surgeons, is that the patient is told that X-ray treatment should be given, without mentioning that there is any difference in the manner in which the treatment is administered.

It is the duty of all to urge the necessity of radiation being given in such a manner as to saturate the site of operation, and also the adjacent lymphatic glands, thus producing a physiological result. In prescribing mercury for syphilis, great fear of producing salivation would not induce us to prescribe 1/100 of a grain when two grains were indicated. The same is true in treating carcinoma with the X-ray.

This comparison appealed to me after having gone over the subject with a number of surgeons and Roentgenologists, and having been consulted by at least a dozen patients during the past year, where a recurrence has taken place. None of these cases showed any evidence of radiation although one patient had received fifty treatments.

Inadequate treatment is not only useless, but I believe, small doses stimulate growth of tissue, while efficient radiation retards and destroys new growths.

A study of the lymphatic glands and of their involvement by carcinoma where the adjacent organs are effected,

---

\* Read before Pittsburg Academy of Medicine, Nov. 26, 1907.

as well as the physiological action of the X-ray on lymphoid tissue must be understood, before either the surgeon or Roentgenologist can speak intelligently of post X-ray treatment. Otherwise his opinion may be based upon cases which were not carcinoma at all, or upon the results obtained in cases which were hopeless when referred for treatment, or cases improperly treated. One physician has referred to me at least fifteen cases of recurrent carcinoma in which the deep glands were involved, none of which lived over three years, and because none of these cases lived over three years, he discredits the value of X-ray in malignant disease, although all the external signs of recurrence cleared up in at least five cases. Now, had he referred these cases within a few days after operation and had the glands adjacent to his lines of incision been rayed to such an extent that these glands had been obliterated, that is to say, had undergone a fibrous degeneration, possibly the results would have been different in some cases at least. The great trouble has been, that much of the post X-ray treatment has been given in a half hearted manner without really knowing what physiological results should be obtained.

In the past the possession of an X-ray machine was all that was thought necessary, but in the future since the pathologist has come to our assistance and has told us why we are obtaining results, and since we are able to give a therapeutic dose the value of the X-ray has changed.

The treatment of malignant disease by the X-ray varies with the situation, and no rules can be laid down unless so modified, as no one would state that the X-ray is as useful in the treatment of carcinoma of the uterus as in epithelioma. It is a question whether we can expect to even prevent recurrence in carcinoma of the uterus on account of the adjacent glands being so deeply situated, while in cancer of the skin it is a question if it is necessary to operate at all in many cases.

Probably, post X-ray treatment is the most useful in carcinoma of the breast, because here the adjacent glands

under the clavicle and near the site of the operative field can be made to undergo fibrous degeneration by a number of post X-ray treatments, but if the bronchial and mediastinal glands are involved, I believe, the operation is not only useless but also the X-ray treatment as far as a permanent cure is concerned.

A word in regard to cases where recurrence has taken place, following the Halsted operation. Out of a series of cases where recurrence has taken place, with nodules studded over the chest, I have been unable to apparently cure more than three cases, although some lived over three years. These cases all had bronchial and mediastinal involvement when radiation was begun. However, in about twenty-five per cent. of these cases all external signs of the disease disappeared, and the patient improved in general health, more than likely this was due to the increase in metabolism which takes place under Roentgen treatment. To prove that bronchial metastasis had taken place when X-ray treatment was begun and that the radiation had nothing to do with internal glandular involvement, I made radiographs of a number of these cases and found the bronchial glands enlarged when they were referred.

When such a condition exists is it worth while raying these cases? This is answered by stating that the patient's life is prolonged from six months to three years and the health improved for a time at least.

Now what should we do when a patient with carcinoma of the breast presents herself for treatment? I am going to suggest the following from experience gained from studying a number of cases.

(1) If only a mass in the breast:—The mass should be removed, a pathological examination made and if found to be cancerous, a complete operation done followed by X-ray treatment.

(2) If there is only a small amount of glandular involvement, complete operation followed immediately by intense X-ray treatment.

(3) If there is an extensive glandular involvement:— Intense radiation given daily until the axillary glands cannot be palpated. Then complete operation and X-ray, if it is given at all, given cautiously.

The last statement was made from the study of ten such cases where glandular involvement was extensive and operation did not seem advisable when the diagnosis was made.

To briefly summarize these ten inoperable cases (classed as inoperable as there was extensive involvement of both axillary and supra-clavicular lymphatics, together with broken down masses or masses about to break down), seven were operated upon after thorough radiation. In only two of these cases was there a radical or Halsted operation done, and in the other five a modified operation was performed. Of the two complete operations, one is living four years and one died within twenty-four hours. Of the five modified operations, two lived over three and one-half years and one died within six months. The other two are living and no sign of recurrence, one at five and the other at seven months after operation. Of the cases not operated, one lived one year and the second is much improved after six months. The third case has been in good health for four and one-half years and the small hardened mass in the breast has remained stationary and freely movable and the glands in axilla which were as large as a walnut when treatment was begun cannot be palpated at all.

I have repeatedly urged that both these cases be operated upon.

Strange, as it may appear the benefits derived from ante-operative treatment in the above cases is marked compared with the results obtained in the treatment of recurrent cases after operation. This leads me to believe that all cases of carcinoma of the breast should have thorough anteoperative X-ray treatment or early and competent postoperative radiation.

Three surgeons after operating on several cases in

which anteoperative Roentgen treatment had been given made the following statements:

The enlarged lymphatics are if palpable degenerated into fibrous cords, the tumor mass is surrounded by scar tissue, its center having undergone caseous degeneration. A very noticeable and gratifying result of ante-operative X-ray treatment is the almost complete disappearance of the normal scar tissue which follows operation.

*Sarcoma.*—The malignancy of sarcoma varies more than carcinoma and therefore the end results are not as good by any form of treatment. I have treated about twenty-five cases, all of these except eight were inoperable when they were referred, and out of the hopeless class I have only one case which has remained well without a recurrence over fifteen months, although some of them have lived for over two years.

This was in an inoperable sarcoma, at the junction of the sternum and clavicle, about twice the size of an orange, and very painful. Treatment was given in series for a period of six months when the mass was reduced to about the size of an egg. The patient refused operation and it was not urged as we considered that it would recur whether we operated upon it or not. Several similar cases remained stationary until they were removed when internal metastasis occurred promptly. It has remained stationary fifteen months, but it certainly is only a question of time until the result will prove fatal.

Of the others nearly all showed some improvement after the first fifteen or twenty treatments, that is to say the tumor decreased in size and the patient's general health would be much improved. In three lympho-sarcoma's the results were more marked, and one case, that had been refused operation in Baltimore, the mass in the neck almost disappeared for a period of six months when Coley's toxins were added to the X-ray. From this time the patient rapidly became worse and died from metastasis.

I have used Coley's toxins in a few cases but I cannot

say that the results have been any better, and I am of the opinion that the Roentgen rays must be given more carefully, if given in conjunction with the toxins.

At the 1905 meeting of the American Roentgen Ray Society held in Baltimore, Dr. Coley read a paper, and out of sixty-eight inoperable cases treated by the combination of the X-ray and toxine he only reported that in six cases complete disappearance of the disease was observed. I believe, that better results than this should be obtained by more powerful X-ray treatment, which could be given if no toxine were administered.

In my opinion the time to use toxine treatment, if at all, is after the X-ray has been used until the patient has received the increase in metabolism which is usually marked after from twenty or thirty exposures of X-ray of sufficient intensity and auto-intoxication has subsided.

My experience in post X-ray treatment for sarcoma is limited to eight cases, and this is certainly too small a number, to more than state that it seems to be the proper method. In one case of lympho-sarcoma, a recurrence took place while I was raying the patient. As soon as this was noticed very intense radiation was given and in six weeks no glands were palpable. The patient is still under observation and time alone can tell the end results. In this connection, I would like to report a case where the results seem brilliant from operation followed by intense radiation.

Miss A., operated upon by Dr. O. C. Gaub, July 4, 1907. The disease started over the left temple and before the patient came to Dr. Gaub the growth had been removed by another physician, and recurred, besides, the cervical glands were involved on the left side.

Dr. Gaub removed the disease below the left eye and all the structures in front of the anterior scalenus muscle except the main blood vessel and nerve, en masse down to the sterno clavicular articulation.

The pathological examination revealed a melano-sarcoma. X-ray treatment was begun the second day after the operation

and given daily for a month, and then irregularly until fifty treatments were given. The present result is gratifying, but of course time is too short to say that there will be no recurrence. The cosmetic result is excellent, as there is less scar than one could possibly conceive since the wound healed by granulation. This is due undoubtedly to absorption of scar tissue by the rays. The absorption of the scar and adhesions is always very noticeable in post X-ray work.